(57) **Abstract:** A method of calculating a sampling function for fabricating a N-channel grating, the method comprising the steps of forming a summation of N periodic seeding functions each describing a refractive index variation, wherein each periodic function includes a phase shift value $\Phi_l(l=1,...N)$ with respect to the other functions, and wherein at least one phase shift value is non-zero. The sampling function may be expressed as: $\Sigma ? \exp[i(K_oz+\Theta+(2l-N-1)\Delta\kappa z/2+\Phi_l]=\kappa Q\exp[i(K_oz+\Theta+\psi)]$, where $Q=Q(z)$ is the amplitude and $\psi=\psi(z)$ is the phase of the sampling function, and the summation is performed over $l=1,...N$. The method may further include the step of determining a set of the phase shift values for which a maximum value of the sampling function amplitude is minimised.